

## Remarks

### Amendments to Claims

Independent claim 1 has been amended to include the limitation of dependent claim 2. Independent claim 5 has been amended to include the limitation of dependent claim 7. Dependent claims 2 and 7 are no longer necessary and are canceled. Independent claims 1 and 5 are further amended to recite that oil-filled polymer comprises a solid polymer matrix for holding the oil when the drill is not in use and for releasing the oil to the cutting surface when the tool is in use. This mode of operation of the lubricant and cutting tool combination is disclosed, for example, in paragraphs 0007 and 0015 of the specification.

Claim 1 recites a cutting tool with a hole extending the length of the body to an outlet at the cutting surface of the tool. Before use of the cutting tool the hole is filled with a volume of a specific lubricant, an oil-filled polymer. The volume of oil-filled polymer is the sole source of lubricant at the cutting surface in an operation of the cutting tool. And the material characteristics of the oil-filled polymer manage the flow of the lubricating oil as it is required. Claim 5 defines a drill in terms of claim elements that are like the recitations of claim 1. The obvious advantage of the cutting tools of independent claims 1 and 5 (and their remaining dependent claims) is that they can be used in a cutting tool powering device that contains no reservoir of lubricant or coolant for the cutting operation. Further, the control of the flow of the oil is achieved by the nature of the oil-filled polymer lubricant. Flow control does not require separate mechanisms in the cutting tool or in the machine powering the cutting tool. The tools contain a supply of oil-filled polymer lubricant that permits oil flow to the cutting surface of the tool as it is in rotational engagement with the workpiece.

Dependent claims 2 and 7 were a part of the original claim set considered by the Examiner in this Office action. Their inclusion as additional limitations in claims 1 and 5, respectively, present no new issues at this stage of the prosecution of this application.

### The Claim Rejections

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kammermeier et al '825 in view of Jamison's publication entitled "New Developments in Microporous Polymer Lubricants" dated May 1985.

Claims 1-3 and 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kammermeier et al '825 in view of Jamison '925.

The Examiner is respectfully requested to reconsider and withdraw these rejections as they apply to the remaining claims 1, 3-6 and 8 for the following reasons.

#### Reasons to Withdraw Claim Rejections

The Kammermeier et al '825 patent discloses cutting tools of complex design, but there is no suggestion that the drills could be filled with an oil-filled polymer lubricant that provides means for self-control of oil delivery through a solid polymer matrix. The drills in the Kammermeier et al disclosure use add-on mechanical structural means to pressurize or retard lubricant flow. Kammermeier et al do not conceive of using an oil-filled polymer as required in applicant's claims. There is no logical basis for combining the Kammermeier et al '825 patent with Jamison's publication or the Jamison '925 patent because Kammermeier et al disclose no concept of seeking a lubricant material that controls its own flow to a cutting tool surface.

Figure 1 of Kammermeier et al illustrates a drill with a shank 1 and a cutter 2. The shank has a recess 5 for holding a coolant or lubricant. The recess is provided with a compression piston 17 for pressing lubricant into the channels 10 of the cutter 2. Kammermeier et al Figures 2 and 3 show other lubricant pressurizing designs for the shank of a drill. Figure 4 shows a ball check valve 29 affecting lubricant flow. And Figure 5 uses a sintered or fibrous capillary storage medium 32 and 32a for controlling the flow of a lubricant.

Kammermeier et al simply do not disclose a cutting tool containing an oil-filled polymer that is capable of controlling its own flow. If Kammermeier et al were to encounter a Jamison type lubricant (and they don't) they would modify the shank portion of their drill to use it.

Thus, neither the Kammermeier et al patent nor its combination with Jamison's publication or the Jamison '925 patent teaches or suggests the cutting tools and lubricant combination recited in independent claim 1 or 5. The rejections should be withdrawn for this reason.

Applicant also urges the Examiner to reconsider his view that Kammermeier et al somehow suggest the use of an oil-filled polymer lubricant as described in the Jamison disclosures.

The Examiner points to column 12 of Kammermeier as showing other lubricants that might be used in his invention. But, as applicant has previously urged, none of these

Kammermeier alternatives suggest the oil-filled polymer containing tools recited in applicant's claims.

At column 12, lines 52-61, Kammermeier identifies eight patents that describe lubricants for use in his drills. U.S. 5,378,379 discloses an aqueous based lubricant and surface conditioner for aluminum cans. U.S. 5,388,631 uses fine particles of boron, graphite, molybdenum disulfide, mica, or talc dispersed in water or alcohol as a lubricating spray for die casting apparatus. U.S. 5,399,274 discloses a lubricant for metal working or forming where the fatty acid and organic phosphate containing lubricant is dispersed or dissolved in a liquid medium and coated on the part. U.S. 5,415,791 discloses solid and liquid lubricant mixtures that can be embedded in apertures or grooves of a metal substrate for sliding applications. U.S. 5,417,869 discloses soaps of carboxylic acids as bioresistant surfactants for cutting oil compositions. U.S. 5,419,413 discloses a tool holder with a pump and conduit for delivering oil to a cutting tool. U.S. 5,427,698 discloses a lubricant coating containing a solid lubricant dispersed in a resin for sliding parts like differential gears, clutch discs, or pulleys. The solid lubricant is a material such as polytetrafluoroethylene, boron nitride, or molybdenum disulfide. And U.S. 5,477,934 discloses a rotary cutter that accommodates the thermal expansion of lubricating grease.

As the Examiner realizes, none of these patents teach or suggest a cutting tool with a lengthwise hole filled with an oil-filled polymer as recited in claims 1-8. So the Examiner turns to the Jamison patent and article without any real technological connection between the disparate disclosures.

Applicant's specification identifies the Jamison patent, U.S. 5,435,925, as describing oil-filled polymer lubrication materials suitable for use in the cutting tools of claims 1-8. But while applicant has recognized the utility of an oil-filled polymer in lengthwise holes of a cutting tool, this concept is not suggested by Jamison or Kammermeier or any other prior art of which Applicant is aware. There is no disclosure in any of the Jamison patent, the Jamison publication or Kammermeier et al that suggests that they can be combined in a proper rejection of Applicant's claims 1-8.

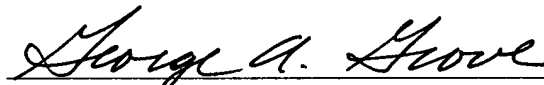
The Jamison '925 patent discloses polyethylene-lubricant compositions that are moldable into lubricant dispensing plastics that retain suitable tribological properties after molding. The patent does not mention cutting, drilling, or tools. While the patent provides a full disclosure of suitable polyethylene compositions, bleed control agents, and oils, the disclosure suggests no application for the molded material in a drill. The combination of Jamison with

Kammermeier is not justified by any teaching within their texts. Only Applicant has seen the use of an oil-filled polymer in a drill, and Applicant's insight is not a suitable basis for rejection of claims 1-8.

The Jamison publication of May 1985 in Lubrication Engineering does not teach the use of his oil-filled polyethylene in drills either. Lubricant applications contemplated by Jamison include molded sliding contacts on machines such as slippers, bushings, packings and wire cores. There is no indication that Jamison had any concept of using oil-filled polymers in passages of cutting tools leading to a cutting surface.

The Examiner is respectfully requested to reconsider all rejections of claims 1, 3-6, and 8, and to allow these claims and to pass the case to issue.

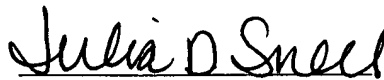
Respectfully Submitted,



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